PROJECT TITLE : SALAMANDER II

PERIOD COVERED : DECEMBER 17, 1981 - JANUARY 17, 1982

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A number of different analytical systems have been tested for the liquid chromatographic separation of the reaction products of a 500-ppm nitrogen dioxide/air mixture under standard ISH measurement conditions. Columns tested were :

Zorbax - ODS
Partisil SCX
Zorbax - NH_2
Brownlee Labs - NH_2
Lichrosorb - NH_2
Partisil - SAX

Difficulties were encountered due to the low solubility of cystine in solvent mixtures compatible with the columns and having a sufficiently low UV absorbance at 210 nm to permit detection.

Of the columns tested, Zorbax - ODS, Partisil - SCX and Brownlee Labs - NH_2 failed to give sufficient separation between cysteineand cystine. Zorbax - NH_2 initially gave a clear separation but deteriorated rapidly for unknown reasons. Three subsequent columns from this supplier failed to meet the minimum performance specifications and have been returned. The initial results showed that about 38% of the cysteine present reacts to give cystine as principal reactions product (90%).

Efforts to confirm this result using a Lichrosorb - NH_2 column have shown the presence of a reaction product coeluting with cysteine. Cysteine and several other reaction products are clearly separated. Separation conditions are now being tried under ion exchange conditions on Partisil - SAX.

FUTURE PLANS

When a satisfactory analysis of the reaction products of cysteine and NO_2 has been made, it is hoped to extend this analysis to the reaction products of smoke passing through a cold trap maintained at -117°.

MUM/jig/JANUARY 19, 1982

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